

WHAT IS CLAIMED IS:

1 1. A method for localization of a shape in a space represented by pixel
2 data forming a multidimensional space i, j , evolving with time, and represented at a
3 succession of instants T , wherein the data is associated with a plurality of parameters $\{A, B,$
4 $\dots\}$ in the form of digital signals $\{\text{DATA}(A), \text{DATA}(B), \dots\}$ composed of a sequence $\{A_{ijt},$
5 $B_{ijt}, \dots\}$ of binary numbers of n bits associated with synchronization signals defining the
6 instants T of the space and the position i, j in the space, at which the signals $\{A_{ijt}, B_{ijt}, \dots\}$ are
7 received, the method comprising:

8 a) receiving the pixel data;
9 b) identifying a main region of interest of the space based on a statistic
10 criterion applied to one of said parameters, the identified region having a center of gravity;
11 c) repeating step b) using the pixel data associated with the main region
12 of interest so as to identify one or more other regions inside the main region;
13 d) for each identified region of interest, incrementing a counter for each
14 consecutive valid frame; and
15 e) recording the center of gravity of each identified region of interest for
16 each valid frame.

1 2. The method of claim 1, wherein a counter is associated with each
2 identified region of interest, wherein a counter value is incremented by one unit at each of
3 successive frames from which the region of interest is identified, wherein the value of each
4 counter is reset to the first frame for which the corresponding region is not identified.

1 3. The method of claim 1, wherein the position of the center of gravity of
2 the points defining a region of interest is stored in a memory.

1 4. The method of claim 1, wherein each region of interest is validated for
2 one value of its associated counter that is greater than 1.

1 5. The method of claim 4, wherein the validated region is identified by its
2 center of gravity, the orientation of its projection axes and the sizes of the associated frame.

1 6. The method of claim 5, wherein the center of gravity, the main axes of
2 the frame and the size of the frame, are respectively the position, the orientation and the size
3 of the object perceived.

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- 1 7. The method of claim 2, wherein inside each region of interest, one or
2 more secondary regions defined by one or more selection criteria are registered.

- 1 8. The method of claim 7, wherein a secondary region plays the part of
2 the region of interest, which leads to registering tertiary regions.

- 1 9. The method of claim 7, wherein localization of the said secondary
2 regions is used for tracking movement within the main region.

- 1 10. The method of claim 1, wherein the parameter is velocity.

- 1 11. The method of claim 1, wherein the parameter is a luminance level.

- 1 12. The method of claim 1, wherein the parameter is a color.

- 1 13. The method of claim 1, wherein the parameter is spatial resolution.

- 1 14. The method of claim 1, wherein the parameter is field depth.

- 1 15. The method of claim 1, wherein the registered region is defined with
2 respect to a mark selected among several marks of different orientations.

- 1 16. The method of claim 1, wherein the relative positions of the centers of
2 gravity of the regions of interest registered serve for controlling the shape of an object
3 perceived.

- 1 17. The method of claim 1, wherein the shape is a human face.

- 1 18. The method of claim 17, wherein the main region is the face and
2 secondary regions are selected from one or more of the eyes, the mouth, the eyebrows and the
3 nose.

- 1 19. A processing device configured to localize a shape in a space
2 represented by pixel data forming a multidimensional space i, j , evolving with time, and
3 represented at a succession of instants T , wherein the data is associated with a plurality of
4 parameters $\{A, B, \dots\}$ in the form of digital signals $\{DATA(A), DATA(B), \dots\}$ composed of a
5 sequence $\{A_{ijt}, B_{ijt}, \dots\}$ of binary numbers of n bits associated with synchronization signals

6 defining the instants T of the space and the position i, j in this space, at which the signals
7 $\{A_{ijt}, B_{ijt}, \dots\}$ are received, the device comprising:

8 first and second histogram calculation units receiving the signals and each
9 generating a classification value;

10 wherein the unit receives a signal carrying a first temporal parameter and the
11 second unit receives two spatial signals;

12 wherein the classification value of the first unit validates a group of points in
13 space that are processed by the second unit, the number of points being n_1 , the classification
14 value of the second unit validating the parameter values processed by the first unit, wherein
15 the units generate jointly a binary signal ZA representing a region of interest and a signal P
16 representing the value of the temporal parameter in the region of interest.

1 20. A device according to claim 19, further comprising a third histogram
2 calculation unit configured to receive a signal carrying a second temporal parameter, wherein
3 the third unit operates similarly to the first unit and replaces the first unit when validating a
4 space having a number n_2 , of points, wherein n_2 is greater than n_1 .

5 21. A device according to claim 19, further comprising a plurality of
6 histogram calculation units configured to receive space signals so as to provide successive
7 validation of several groups of space points.

8 22. A device according to claim 19, wherein the histogram calculation
9 units are controlled by instructions received from API software, and are coupled together by a
10 data bus and by a feedback bus.

1 23. A method for localization of a shape in a space represented by pixel
2 data forming a multidimensional space i, j , evolving with time, and represented at a
3 succession of instants T , wherein the data is associated with a plurality of parameters $\{A, B,$
4 $\dots\}$ in the form of digital signals $\{DATA(A), DATA(B), \dots\}$ composed of a sequence $\{A_{ijt},$
5 $B_{ijt}, \dots\}$ of binary numbers of n bits associated with synchronization signals defining the
6 instants T of the space and the position i, j in the space, at which the signals $\{A_{ijt}, B_{ijt}, \dots\}$ are
7 received, the method comprising:
8 a) receiving the pixel data;
9 b) identifying a region of interest of the space based on a statistic criterion
10 applied to one of said parameters, the region of interest having a center of gravity;

- 11 c) repeating step b) one or more times using the pixel data not associated
12 with a previously identified region of interest so as to identify one or more other regions of
13 interest;
14 d) for each identified region of interest, incrementing a counter for each
15 consecutive valid frame; and
16 e) recording the center of gravity of each identified region of interest for
17 each valid frame.

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